AYK REGION
STOCK STATUS REPORT # 5

STATUS OF COMMERCIAL AND SUBSISTENCE SALMON FISHERIES IN THE WESTERN ALASKA REGION FROM CAPE NEWENHAM TO CAPE PRINCE OF WALES

(ADDENDUM TO INPFC DOC. 1031)

by

Ronald I. Regnart
Michael F. Geiger

Alaska Department of Fish and Game
Division of Commercial Fisheries
Anchorage, Alaska

(PREPARED FOR THE SCIENTIFIC SUBCOMMITTEE OF THE AD HOC COMMITTEE ON ABSTENTION, INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION)

October 1968

INTRODUCTION

The purpose of this report is to discuss the historical importance, utilization and management of the salmon runs in Western Alaska from Cape Newenham north to Cape Prince of Wales with emphasis on the present-day fisheries through 1967. This region encompasses the Kuskokwim, Yukon, Norton Sound and Port Clarence management districts (see Figure 1). The majority of the 21,865 native inhabitants, Eskimo and Indian, reside in 92 villages scattered along the coast and the major river systems, and are directly dependent on the fish and game resources for their livelihood. The fisheries in this area are of two distinct types, commercial and subsistence. Subsistence salmon fishing has long provided an important supply of food to the native residents and their sled dogs. The recent development and expansion of commercial salmon fisheries in this vast area of little industrialization has enabled many of the local residents to obtain a cash income. Other sources of income are limited to sporadic employment and special welfare payments.

All five species of Pacific salmon are indigenous to this region; however, chum salmon are the most abundant. Chums are extensively utilized for subsistence, while king salmon, in terms of dollar value, represent the most important commercial product. Chum, king and coho salmon, in that order, are the most abundant species in the Kuskokwim and Yukon Rivers. In the Norton Sound district, chums and pinks are the most abundant species. Most of the red salmon are found in the area from Cape Newenham to and including the Kuskokwim River. There is a small run of reds in the Port Clarence district, however.

Water quality and spawning habitat in the region have been preserved in their original condition because pollution, logging, and dam construction activities have been minimal or nonexistent.

SUBSISTENCE FISHING

Utilization of salmon for subsistence purposes or personal needs by native fishermen in the region dates back hundreds of years. The remnants of salmon net stone sinkers have been found in old village sites at Cape Denbigh in Norton Sound that date back to 400 B.C. (Giddings, 1964). At present subsistence fishing is still of major importance in most native villages in the region. More salmon of all species are taken for subsistence than for commercial purposes in all districts except Norton Sound. For example, a minimum total of 4.4 million salmon were utilized for subsistence in the Yukon and Kuskokwim Rivers during 1961-1967 compared to a commercial catch of 1.5 million.

Subsistence fishermen operate gill nets in the main rivers and, to a lesser extent, in the marine waters to capture migrating salmon. Fishwheels take considerable numbers of salmon in the Yukon and Kuskokwim Rivers. Beach seines are occasionally used near the spawning grounds to catch schooling or spawning salmon.

Unlike commercially caught salmon there is very little wastage of any portion of fish taken for subsistence purposes. The major portion of the salmon is sundried or smoked for later consumption, while the head and viscera are fed to sled dogs.

For many fishermen the need for a cash income from the sale of commercially caught salmon is secondary to the need of gathering, preparing

and storing of fish (and game) for subsistence purposes. Considering the complete utilization and dependence of salmon by the native people, the subsistence catch is of equal or even greater importance than the commercial catch. In terms of money required to purchase a similar quantity of meat substitute, the subsistence catch exceeds the value of the commercial catch.

During recent years, the Alaska Department of Fish and Game has conducted surveys of the subsistence fisheries. Catch data obtained from the surveys provide information on the relative size of the salmon runs, escapements and trends in the dependence on subsistence fishing which are useful in fishery management. In each village or fishing camp the catches, fishing effort (number of fishing families), amount of fishing gear, number of sled dogs and mechanized snow vehicles are documented. The above information is obtained by personally interviewing each fisherman and by making direct counts of salmon. Some information is obtained from special catch forms or questionnaires. Department survey crews in 1967 travelled approximately 2,200 river miles and 1,100 air miles to interview and document the catches mady by 1,243 fishing families in the region.

The recorded catches, presented later in this report, represent minimum figures for the following reasons:

1. Catches made late in the season after completion of surveys are not always recorded.
2. Some salmon consumed prior to the times of surveys are not always recorded.
3. Information is incomplete or lacking for some villages.

It is estimated that the catches recorded by the Department represent 70-90 percent of the actual subsistence harvests.

Subsistence fishing effort and success is affected by adverse weather and river conditions (i.e., water levels, driftwood, etc.). In addition the opportunities for employment such as short-term construction projects and fire fighting will reduce fishing effort. Taking into consideration the factors affecting fishing effort, the subsistence catches do not always reflect relative salmon abundance.

Over the past several years there has been a gradual decline in the annual subsistence catches in some districts. As increased welfare payments and more employment opportunities become available, the dependence on subsistence fishing is expected to slowly decline. Another factor tending to affect fishing effort is the increasing use of snow vehicles which are beginning to replace sled dogs. Since considerable numbers of salmon are fed to sled dogs, less salmon will be required for subsistence purposes as the dog population declines.

COMMERCIAL FISHING

Although commercial fishing in this region dates back to 1913 (Kuskokwim), the only district having a sustained fishery prior to 1961 was the Yukon district. Reconnaisance surveys conducted during 1959 and 1960 by Department biologists indicated that harvestable surpluses of salmon were available in certain areas. Therefore, the Department liberalized certain regulations and encouraged processors to explore and develop new fishing grounds. As a result, sustained commercial fisheries have been developed in the Kuskokwim and Norton

Sound districts since 1961. In addition salmon catch quotas were abolished for the lower Yukon River in 1961, and the fishery regulated on a flexible basis of open and closed periods each week. These actions have resulted in substantial catch increases during recent years. For example, the commercial salmon catch for the region during the 1960-67 period was nearly 2.5 million fish compared to only 0.5 million taken during the previous eight years; an increase of 400%.

During the 1961-1967 period approximately $4.2 million were paid to fishermen in the region for salmon sold commercially. The wholesale value of the pack during this period is estimated at $14.6 million. In addition it is estimated that $250,000 - $350,000 in wages and salaries is paid annually to processing plant workers and tenderboat operators. Although the economic value of the commercial fishery is low compared to other salmon producing areas of Alaska, the money earned by the native fishermen and workers is of extreme importance since other sources of income are neglibible or nonexistent.

During the past several years, the value of the salmon catch has steadily increased, particularly for chum salmon. Presently the salmon catch is processed mainly as a fresh-frozen or cured product which results in a higher value per fish than a canned product. The salmon of the region are of exceptional quality: bright color, firm flesh and high oil content, since spawning usually takes place in upriver areas. The economic impact of the commercial salmon fishery is expected to be considerably greater during the next several years as modern and less costly means of processing, transporting and marketing are developed.

In addition, there has been an increased demand by Japanese markets for fresh-frozen salmon which is expected to further contribute to the economic development of the commercial fishery.

As explained in the following section (Management and Research) commercial fishing regulations are relatively restrictive in order to insure that sufficient salmon are provided for both subsistence fishery and spawning ground requirements. Excessive operating and shipping costs have also been limiting factors in the recent development of the Commercial fishery. The major fisheries are located in remote areas of the region where there are no roads or railroads and water transportation is limited to a few months each year. Until just recently there has been a shortage of local processing plants, especially cold storage facilities, in some areas.

MANAGEMENT AND RESEARCH

The basic regulation that governs the commercial salmon harvest in all districts is the scheduled weekly fishing period. Commercial fishing is allowed for a total of two to four days a week during the open season depending on the district and species involved. Fishing effort normally occurs during the entire run and not just during any one particular segment of the run. Occasionally, more or less fishing time is allowed depending on fishing conditions and/or the indicated strength of the runs.

Due to the vast size of the region and the silty characteristics of many streams, accurate estimates of the size of salmon runs and escapements cannot be obtained. Management is also hampered by the relative lack of comparative catch and return information since all of the fisheries were either initiated or expanded through liberalization of regulations

during 1961 or 1962. The management problem is further compounded by having to provide sufficient salmon for the important subsistence fishery as well as for spawning purposes.

For these reasons, the present commercial fishery is considered to be experimental in nature. It has been the policy of the Alaska Department of Fish and Game to maintain recent levels of commercial utilization (since 1961-62) for a few years in order to establish definite trends in subsistence utilization and to obtain more comprehensive data on catch and return. This is the only practical course of action, in view of the need to ensure an adequate supply of food for the native population, and also because accurate information on which to precisely manage the commercial fishery is not available at this time.

There are indications that the dependence on subsistence fishing is declining in some districts. If this trend continues over the next few years and normal salmon returns are experienced, then the Department will take further action to make available more salmon for commercial utilization.

A possible increase in the efficiency of the commercial fishery may balance any immediate decline in subsistence utilization with the result that present regulations involving commercial utilization may be maintained or even made more restrictive during the next few years. For example, an increase in the efficiency of the commercial fishery can occur as the fishermen become more skilled and competitive in addition to using better boats and fishing gear. Along with increased numbers of fishermen, a definite increase in efficiency has been noted for the Yukon River king salmon fishery during the last several years.

As a result, regulation restrictions were promulgated for this fishery which became effective during 1968.

Alaska Department of Fish and Game research projects consist essentially of test fishing, tag and recovery, and catch sampling studies. These studies yield information on timing, abundance, movements, destination, and the age, sex and size composition of the various salmon runs. The results of these studies are applicable toward management of the commercial fishery on a more scientific basis. Since 1960-61 a total of $827,607 has been expended on research and management projects in the region including the Kotzebue district (see Table 1).

STATUS OF DISTRICT FISHERIES

KUSKOKWIM DISTRICT

Commercial Fishing

This district includes all waters of the Kuskokwim River drainage and all waters from 62° N. latitude southward to Cape Newenham. Commercial fishing for salmon is currently allowed in the Kuskokwim River upstream from Eek Island (subdistricts 335-10; 335-20) and in a small section of Kuskokwim Bay near the village of Quinhagak (subdistrict 335-40).

All five species of salmon enter streams of the district, but commercial fishing in the Kuskokwim River is prohibited during late June through July when the chum and red salmon runs are in progress. In addition only king salmon can be taken for commercial purposes prior to August 1 in the Kuskokwim River. These regulations are for the purpose of reserving chum and red salmon for subsistence utilization.

All species of salmon can be taken commercially in the Quinhagak area where the majority of the salmon are bound for the Kanektok River and sustain only limited subsistence utilization.

Table 2 shows the numbers of vessel and gear licenses issued during the 1960-1967 period. The numbers of licensed fishermen have increased slowly each year since 1962. A total of 256 fishing vessels were registered in 1967 which was exceeded only by 305 that registered in 1962. The majority of the catch is made by drift gill nets with set gill nets used only to a minor extent.

Commercial fishing in this district dates back to 1913 when 7,800 king salmon were harvested (Table 3). During the 1913-1960 period (48 years), commercial king salmon catches were recorded for 26 years, averaging 6,181 annually. Catches of other species of salmon were even more sporadic and limited. Recognizing the potential of the commercial fishery, the Department liberalized certain regulations in 1961 which resulted in 23,246 king salmon taken commercially that year. Average annual catches since 1960 have been 23,528 and 22,250 for king and coho salmon respectively. There has been only limited commercial utilization of red and chum salmon, with nearly all of the catches coming from the Quinhagak area. The 1967 district catch of nearly 30,000 king salmon was the second largest recorded catch in the history of this fishery (34,853 taken in 1920). The record 1967 coho salmon catch of 58,239 doubled the previous record catch of 28,992 in 1964. The record 1967 king and coho salmon catches apparently resulted from increased fishing effort and above-average sized runs.

The majority of the district's king and coho salmon catches are taken in the lower Kuskokwim River (335-10) where the salmon are in prime condition. During recent years the king salmon season in this subdistrict has been opened by field announcement in early June with fishing allowed for two 24-hour fishing periods each week. Usually five to seven 24-hour periods are fished until the season is closed by field announcement in late June. Commercial fishing for coho salmon is reopened for four to five days a week beginning August 1. Fishing time is often increased during the coho salmon season to compensate for decreases in fishing effort and efficiency as a result of frequent storms.

Subsistence Fishery

Table 3 also shows subsistence catches recorded for the district since 1922. Table 4 shows comparative subsistence fishery data for 1960-1967. "Small salmon" catches include all species of salmon except kings and are composed of a majority of chum salmon. The Department of Commerce and the Bureau of Commercial Fisheries (U.S. Fish and Wildlife Service) conducted surveys of the subsistence fishery prior to 1960. In most cases, especially in the earlier Department of Commerce surveys, the design and coverage of each survey was not sufficiently documented and accuracy cannot be determined. For these reasons, it is not possible to make comparisons with recent catches obtained by the Alaska Department of Fish and Game since 1960. Department surveys have covered the Kuskokwim River from its mouth to Stony River with catch reports occasionally received from the area above Stony River.

Since 1960 annual king salmon catches have averaged 32,885 and "small salmon" catches have averaged 211,933. The 1967 harvest of 61,342 king salmon was the largest catch recorded during the past eight years that Department surveys have been conducted. Subsistence fishing effort and catches have not declined noticeably since 1960 when Department surveys were initiated, and this fishery still represents the most important utilization of all species of salmon in the district. An increased demand for a cash income and gradual replacement of dog teams by mechanized snow vehicles may result in an eventual decline in present levels of subsistence utilization.

Escapement Indices

With an area of about 52,000 square miles, the Kuskokwim district drainage spawning escapement is very difficult to evaluate. Adverse weather and stream conditions have prevented sustained annual escapement surveys so that comparable data are lacking for most streams.

Limited data indicate that the 1966 and 1967 king salmon escapements were above average when compared to the 1960-1965 period. More comparable data is available for the Aniak River (main stem) than any other stream as it has been surveyed each season since 1960 with the exception of 1963 and 1964. Aerial survey counts of king salmon for this stream are as follows: 1960 (1,881), 1961 (494), 1962 (916), 1965 (646), and 1966 (2,184). Only the upper Aniak River could be surveyed in 1967 when a total of 758 king salmon were observed. Only 485 king salmon were observed in the same section of stream during 1966.

Aerial surveys of chum salmon, the majority of which spawn in the lower stream sections, and late running coho salmon could not be made during most years.

YUKON DISTRICT

Commercial Fishery

This district includes all waters of the Yukon River and its tributary streams and all coastal waters from Cape Stephens, including Stuart Island, southward to 62° N. latitude. Commercial fishing for salmon is permitted upstream from the mouths of the Yukon and Black Rivers.

The commercial fishing area is divided into four subdistricts (334-10, 334-20, 334-30, and 334-40) for regulatory purposes. These subdistricts are further divided into statistical areas for management and research purposes.

The main commercial fishery is located in the lower two subdistricts, 334-10 and 334-20. Since 1961 the king salmon season in these two subdistricts has opened on June 1, with fishing for four days a week, and has been closed by field announcement by late June or early July depending on the strength of the run. During recent years commercial fishing has been reopened in subdistrict 334-10, beginning in late July (fall fishery). The mid-season closures in these subdistricts are for the purpose of insuring that adequate catches of summer chum salmon are made by upriver subsistence fishermen. Commercial fishing in subdistrict 334-30 is allowed for a total of four days a week until quotas of 3,000 king and 3,000 chum and coho salmon combined are taken. In subdistrict 334-40 fishing is allowed seven days a week until quotas of 2,000 king and 2,000 chum and coho salmon combined are taken. These quotas have been established for the purpose of allowing a very limited commercial utilization which has traditionally occurred for many years.

Table 5 shows the numbers of vessel and gear licenses issued annually during the 1960-1967 period. A record total of 549 fishing vessels registered for the district in 1967 compared to 229 in 1960, an increase of 140%.

King salmon have been taken commercially since 1918 with the exception of 1925 to 1931 (Table 6). Prior to 1961 the king salmon fishery was restricted to catch quotas of varying sizes; a quota of 50,000 was in effect during most years. During the 1954-1960 period, a 65,000 quota and commercial fishing for 5½ days a week were allowed. Since 1961, the quotas have been removed for most of the fishery (subdistricts 334-10 and 334-20) which has been regulated by scheduled openings and closures each week. Under these new regulations the king salmon catches have averaged 109,527 since 1961 compared to 64,952 taken during the previous seven year period (1954-1960), an increase of about 70%.

Table 7 presents king salmon catch and catch per vessel hour data for 1960-1967. The 1967 district catch of 129,691 was the largest ever recorded and was a result of increased fishing effort and an above-average run.

A total of 120,203 kings were harvested commercially in 1961, almost double that of previous years. Since six-year-old king salmon are the greatest contributors to the commercial catch, the 1967 fishery was anticipated as the first test of the present system of management. On the basis of the record catch made in 1967, it appears that the 1961 fishery permitted sufficient numbers of king salmon to spawn and produce a run of similar magnitude. In addition, age structure of the 1967 catch was very similar to that of previous years.

Further restrictions, however, seem necessary as fishing effort has increased and fishermen have become more efficient in the capture of king salmon. Escapements in recent years may represent a smaller percentage of the total run. The limited escapement data (see next section) collected since 1959 indicates that this is true, at least in some areas.

In order to insure that sufficient numbers of salmon are available for spawning ground and subsistence fishing requirements, the Alaska Board of Fish and Game adopted the following regulation changes beginning with the 1968 season:

1. Reduction in fishing time in subdistricts 334-10 and 334-20 from 4 to 3½ days a week during the king salmon season.
2. Prohibit the use of drift gill nets of over 50 fathoms in length. (The previous limit was 150 fathoms). Although actual gear in use seldom exceeded 50 fathoms, any further development of the drift fishery would have the undesirable effect of increasing the catch.

There was relatively unrestricted commercial utilization of chum and coho salmon during the 1918-1921 period with catches ranging from 100,000 (1918) to 365,000 (1919). The 1919 catch has never been surpassed. As a result of poor catches made by upriver subsistence fishermen, largely precipitated by the 1919 commercial chum salmon catch, the Yukon commercial fishery was sharply curtailed during 1922-1924 and completely closed during 1925-1931. Since 1922 limited commercial catches of chum and/or coho salmon have been taken only in 1952, 1956, and 1961-67.

The 1967 district harvest was 11,031 coho and 49,198 chum salmon. The average annual catch made during the 1961-1967 period was 9,263 coho

and 41,415 chum salmon. A majority of these catches are made during the fall run (late July - August) when only moderate subsistence utilization is made.

Subsistence Fishery

Table 6 shows subsistence catches recorded since 1918. Department of Fish and Game surveys were initiated in 1961, but cannot be compared with survey data obtained from past years. Similar to surveys of the Kuskokwim River fishery, methods and coverage of the earlier surveys were not documented and their accuracy cannot be determined.

Subsistence catches of Yukon River "small salmon" (mostly chums) have declined markedly during the past two seasons (See Table 8). Although adverse fishing conditions, salmon abundance, and the immediate employment situation have had some effect, the reduced catches are probably the result of a decline in the dependence on subsistence fishing.

King salmon catches have fluctuated during the past seven years, but a definite decline in recent year catches is not indicated. The 1967 king salmon catch was definitely better than that of 1966.

Escapement Indices (king salmon)

Very little good information regarding 1967 spawning escapements was obtained due to high and turbid conditions of the tributary streams throughout the drainage. Table 9 presents king salmon escapement data obtained for certain areas during the 1960-1967 period.

Surveys of the Andreafsky and Anvik Rivers on July 22, 1967, indicated better king salmon escapements than in 1966. It was difficult to judge comparative escapements in these streams for the past several seasons because of poor counting conditions. For example, only about

are shown in Table 10. There is evidence that in some subdistricts, e.g., Unalakleet area, sufficient escapement has not been obtained because of intensive commercial and subsistence fisheries. Aerial survey estimates of escapements and subsistence catch data are presented in Tables 11 and 12 respectively.

The district commercial catch of all species of salmon combined was greatest in 1962 when 7,286 kings, 9,156 cohos, 33,187 pinks, and 182,784 chums were taken. The record catch in 1962 was attributed to a larger than average run of chum salmon coupled with peak levels of fishing effort, processing facilities, and tenderboat service. The catches in 1962 of king and chum salmon, the most valuable commercial species, probably represents the maximum potential harvest that can be expected in any given year.

PORT CLARENCE DISTRICT

The Port Clarence District includes all waters from Cape Douglas northward to Cape Prince of Wales. Chum, pink, and red salmon are the most abundant species. The red salmon run, although of very small magnitude, compared to major red runs elsewhere in Alaska, is believed to represent the largest northernmost known population in the State. The majority of salmon in the district are bound for the Agiapuk and the Kuzitrin River systems, the major salmon producing streams. Aerial survey estimates of escapements are presented in Table 13.

Salmon are heavily utilized by subsistence fishermen at Teller and Brevig Mission operating nets at the Grantley Harbor-Tuksuk Channel area. In addition subsistence fishermen take salmon in close proximity to the spawning grounds upriver. Subsistence catch data are presented in

one-half of the Andreafsky River (main fork) was surveyed during 1967 at which time 276 king salmon were observed under less than optimum counting conditions. This entire stream was surveyed in 1966 under optimum conditions with only 303 observed. Counts for this stream have ranged from 303 to 1,220 during the 1960-1966 period.

The Whitehorse dam counts made during 1967 were below average, the second lowest count since 1960.

NORTON SOUND DISTRICT

The Norton Sound District includes all waters from Cape Stephens northward to Cape Douglas. Commercial fishing in the district dates back only to 1961. The commercial fishery is a collection of separate fisheries operating near the mouths of major river systems or groups of rivers. There are eight major salmon producing river systems in the Norton Sound district: Fish-Niukluk, Kwiniuk, Tubutulik, Koyuk, Inglutalik, Ungalik, Shaktoolik, and Unalakleet Rivers. To allow for more precise regulation of these fisheries, the district has been divided into six subdistricts. In all subdistricts chums and pinks are the most abundant species of salmon. A small run of king salmon occurs in the Unalakleet and Shaktoolik areas.

Fishing effort in the district as a whole has fluctuated from year to year as processing facilities or tenderboat service were not available for some subdistricts. In those subdistricts not commercially fished during some years, salmon are instead utilized for subsistence. Commercial fishing effort has remained at a relatively constant level in the major subdistricts. Annual commercial catches and fishing effort data

Table 14. The recorded subsistence catches represent probably less than 50% of the actual harvest. The only recorded commercial fishery occurred in 1966 when 7 fishermen took only 93 reds, 131 pinks, and 992 chums. Presently the outlook is for continued utilization of the salmon runs for subsistence and to a lesser degree for a small scale commercial fishery with salmon being purchased by local stores in the area.

REFERENCES

Alaska Department of Fish and Game. Annual Reports of the Arctic-Yukon-Kuskokwim Area, 1962-1967 (Mimeographed), Anchorage, Alaska.

Giddings, J. L. 1964. The Archeology of Cape Denbigh. Brown University Press, Providence, R. I.

Pennoyer, Steven, Kenneth R. Middleton, and Melvan E. Morris, Jr. 1965. Arctic-Yukon-Kuskokwim Area Salmon Fishing History. Alaska Department of Fish and Game, Informational Leaflet 70.

FIGURE I. A-Y-K AREA MAP

ALASKA DEPARTMENT OF FI[SH AND GAME]
Route Slip
TO:
DIV:
LOC.
ATTN:
Shaktoolik is misspelled
From:
Date:
MOORE BUSINESS FORMS, INC.

TABLE 1

ANNUAL EXPENDITURES FOR FISHERY RESEARCH AND MANAGEMENT
IN ARCTIC - YUKON - KUSKOKWIM AREA
FISCAL YEARS 1960 - 61 to 1967 - 68 1/

FISCAL YEAR	MANAGEMENT - RESEARCH (STATE FUNDS)	RESEARCH (FEDERAL FUNDS)	MANAGEMENT-RESEARCH (COMBINED FUNDS)
1960 - 61	$ 48,000.00	$	$ 48,000.00
1961 - 62	67,000.00	42,000.00	109,000.00
1962 - 63	85,000.00	42,000.00	127,000.00
1963 - 64	97,995.00		97,995.00
1964 - 65	87,900.00		87,900.00
1965 - 66	86,210.00		86,210.00
1966 - 67	96,300.00	17,000.00	113,300.00
1967 - 68	108,202.00	50,000.00	158,202.00
TOTALS	$ 676,607.00	$151,000.00	$827,607.00

1/ Includes Kotzebue, Port Clarence, Norton Sound, Yukon and Kuskokwim districts; estimate that 90% of funds devoted for salmon research and management.

TABLE 2

KUSKOKWIM DISTRICT (335) VESSEL AND GEAR LICENSES,
1960-1967

Year	Vessel 1/	Set Net	Drift Net
1960	51	17	28
1961	169	15	194
1962	305	55	283
1963	154	27	136
1964	172	29	148
1965	169	24	213
1966	200	9	194
1967	253	17	239
Average	184	24	179

1/ Does not include Tenders

TABLE 3 KUSKOKWIM DISTRICT COMMERCIAL AND SUBSISTENCE SALMON CATCHES, 1913 - 1967

YEAR	COMMERCIAL CATCH					SUBSISTENCE CATCH		
	King	Coho	Red	Chum	TOTAL	King	Small Salmon (1)	TOTAL
1913	7,800				7,800			
1914			2,667		2,667			
1915								
1916	949				949			
1917	7,878				7,878			
1918	3,055				3,055			
1919	4,836				4,836			
1920	34,853				34,853			
1921	9,854				9,854			
1922	8,944		6,120		15,064			180,000
1923	7,254				7,254			
1924	19,253	7,167	900	7,167	34,487	14,700	203,148	217,848
1925	1,664		5,850		7,514	10,800	230,850	241,650
1926							738,576	738,576
1927							286,254	286,254

(1) Mostly chum salmon but including small numbers of pinks, reds, and cohos

TABLE 3 continued

YEAR	COMMERCIAL CATCH King	Coho	Red	Chum	TOTAL	SUBSISTENCE CATCH King	Small Salmon (1)	TOTAL
1928							481,090	481,090
1929							560,196	560,196
1930	7,515		2,448		9,963		538,656	538,656
1931	8,541				8,541		389,367	389,367
1932	9,399				9,399		746,415	746,415
1933						6,290	433,993	440,283
1934						20,800	597,132	617,932
1935	6,448	8,296			14,744	22,930	554,040	576,970
1936	624				624	33,500	549,423	582,923
1937	480				480		537,111	537,111
1938	624	828			1,452	10,153	400,242	410,395
1939	134				134	14,000	125,425	139,425
1940	247	500			747	8,000	415,523	423,523
1941	187	674			861	8,000	415,523	423,523
1942						6,400	325,339	331,739

(1) Mostly chum salmon but including small numbers of pinks, reds, and cohos

TABLE 3 continued

YEAR	COMMERCIAL CATCH					SUBSISTENCE CATCH		
	King	Coho	Red	Chum	TOTAL	King	Small Salmon (1)	TOTAL
1913	//					6,400	325,800	332,200
.....								
1946	2,288	674			2,962			
1947	5,356				5,356			
.....								
1951	2,808				2,808			
.....								
1959	3,760				3,760			
1960	5,969	5,498	5,649		17,116	19,457	337,067	356,524
1961	23,246	5,090	2,308	18,954 (2)	49,598	28,898	185,301	214,199
1962	20,875	12,598	10,313	50,053 (2)	93,839	13,596	164,417	178,013
1963	18,571	15,660			34,231	34,615	140,890	175,505
1964	21,230	28,992	13,422	1,646 (2)	65,290	30,853	214,942	245,795
1965	24,965	12,191	1,886	4,242	43,284	25,043	250,878	275,921
1966	25,823	22,985	1,030	2,878 (2)	52,716	49,280	180,054	229,334
1967	29,986	58,239	652	8,235	97,112	61,342	221,918	283,260

(1) Mostly chum salmon but including small numbers of pinks, reds, and cohos.

(2) Includes small numbers of pink salmon.

TABLE 4

COMPARATIVE KUSKOKWIM DISTRICT SUBSISTENCE FISHERY DATA
1960 - 1967
(Numbers per Fishing Family in Parentheses)

YEAR	Number of Fishing Families Surveyed	Number of People	Number of Sled Dogs	FISHING GEAR	
				Gill Nets	Fishwheels
1960	351	2069(5.9)	2337(6.7)	1/	85
1961	374	2250(6.0)	2368(6.3)	270	65
1962	359	2335(6.5)	2262(6.3)	332	64
1963	410	2578(6.1)	2223(5.3)	683	47
1964	405	2647(6.3)	2275(5.4)	592	40
1965	389	1/	1/	551	30
1966	604	3604(6.0)	2692(4.5)	854	37
1967	588	3712(6.4)	2950(5.1)	1030	31

1/ Information not available

TABLE 5

YUKON DISTRICT (334) VESSEL AND GILL NET LICENSES, 1960-1967

Year	Vessel 1/	Set Net	Drift Net
1960	229	244	46
1961	350	338	103
1962	490	436	177
1963	413	383	114
1964	451	409	159
1965	486	420	164
1966	516	468	189
1967	549	431	249
Average	436	391	150

1/ Does not include Tenders

TABLE 6 YUKON DISTRICT COMMERCIAL AND SUBSISTENCE SALMON CATCHES, 1918 - 1967

YEAR	COMMERCIAL CATCH				SUBSISTENCE CATCH		
	King	Coho	Chum	TOTAL	King	Small Salmon (1)	TOTAL
1918	12,239	26,144	73,921	112,304		1,400,000	1,400,000
1919	104,822	37,070	327,898	469,790		269,000	269,000
1920	58,467		155,655	214,122	20,000	860,000	880,000
1921	69,646	1,000	111,098	181,744			
1922	16,825			16,825	15,000	330,000	345,000
1923	13,393			13,393	17,500	435,000	452,500
1924	27,375			27,375		1,130,000	1,130,000
1925					15,000	259,000	274,000
1926					20,500	555,000	575,500
1927						520,000	520,000
1928						670,000	670,000
1929						537,000	537,000
1930						633,000	633,000
1931					26,693	565,000	591,693
1932	4,739			4,739	23,160	1,092,000	1,115,160
1933	8,829			8,829	19,950	603,000	622,950
1934	25,365			25,365		474,000	474,000
1935	7,265			7,265	20,400	537,000	557,400

(1) Mostly chum salmon but including small numbers of pink and coho salmon.

TABLE 6 continued

YEAR	COMMERCIAL CATCH King	Coho	Chum	TOTAL	SUBSISTENCE CATCH King	Small Salmon (1)	TOTAL
1936	20,963			20,963	22,750	560,000	582,750
1937	6,226			6,226	5,528	346,000	351,528
1938	13,727			13,727	19,244	340,450	359,694
1939	9,987			9,987	18,050	327,650	345,700
1940	18,053			18,053	14,400	1,029,000	1,043,400
1941	29,905			29,905	17,703	438,000	455,703
1942	22,487			22,487		197,000	197,000
1943	27,650			27,650		200,000	200,000
1944	14,232			14,232			
1945	19,727			19,727			
1946	22,782			22,782			
1947	54,026			54,026			
1948	33,812			33,812			
1949	36,379			36,379			
1950	41,808			41,808			
1951	47,196			47,196			
1952	34,405	10,868 3/		45,273			
1953	59,273			59,273		380,000	380,000

(1) Mostly chum salmon but including small numbers of pink and coho salmon.

(3) Previously unreported in Fishery Reports; taken from catch records of Yukon Fisherman Cooperative Association, probably includes some chum salmon.

TABLE 6 continued

YEAR	COMMERCIAL CATCH				SUBSISTENCE CATCH		
	King	Coho	Chum	TOTAL	King	Small Salmon (1)	TOTAL
1954	59,401			59,401			
1955	58,684			58,684			
1956	63,478		8,000	71,478			
1957	63,623			63,623			
1958	63,259			63,259	11,890	337,500	349,390
1959	78,632			78,632			
1960	67,591			67,591			
1961	120,260	2,855	42,461	165,576	23,719	407,814	431,533
1962	94,734	23,339 ?	53,767 (2)	171,840	19,910	358,441	378,351
1963	116,994	5,572		122,566	32,656	421,625	454,281
1964	93,587	2,446	8,347	104,380	22,817	485,630	508,447
1965	118,098	350	23,317	141,765	19,723	458,379	478,102
1966	93,315	19,254	71,405	183,974	14,017	214,236	228,253
1967	129,706	11. 031	49,401	190.138	19.661	288.595	308.256

(1) Mostly chum salmon but including small numbers of pink and coho salmon.

(2) Includes small numbers of pink salmon.

TABLE 7

YUKON DISTRICT (334) KING SALMON COMMERCIAL CATCH DATA, 1960 - 1967 1/

	YEAR	334-10	334-20	Sub-Total (10+20)	334-30	334-40	Totals - 334
COMMERCIAL CATCH							
	1960	50,713	15,994	66,707		884	67,591
	1961	84,406	29,028	113,434	4,965	1,804	120,203
	1962	67,072	22,224	89,296	4,687	724	94,707
	1963	85,004	24,211	109,215	6,976	803	116,994
	1964	67,555	20,246	87,801	4,705	1,081	93,587
	1965	89,268	23,763	113,031	3,204	1,863	118,098
	1966	70,783	16,927	87,710	3,612	1,988	93,310
	1967	104,335	20,289	124,624	3,618	1,449	129,691

	YEAR	334-10	334-20	Sub-Total (10+20)	334-30
BOAT HOURS (Catch per boat hour)	1960	40,848 (1.24)	34,914 (0.46)	75,762 (0.88)	
	1961	79,224 (1.07)	29,118 (1.00)	108,342 (1.05)	2,808 (1.77)
	1962	84,792 (0.79)	38,118 (0.58)	122,910 (0.73)	2,520 (1.86)
	1963	72,288 (1.18)	27,672 (0.87)	99,960 (1.09)	5,616 (1.24)
	1964	56,736 (1.19)	22,398 (0.91)	79,134 (1.11)	4,596 (1.02)
	1965	78,096 (1.14)	31,008 (0.77)	109,104 (1.04)	2,286 (1.40)
	1966	69,894 (1.01)	22,380 (0.76)	92,274 (0.95)	1,782 (1.23) 2/
	1967	102,456 (1.02)	37,488 (0.54)	139,944 (0.89)	4,050 (0.89)

1/ King Salmon season only

2/ Catch per vessel hour does not include 1,421 King Salmon captured by an unknown number of fishermen

TABLE 8

YUKON RIVER COMPARATIVE SUBSISTENCE CATCH AND EFFORT DATA, 1961 - 1967
(Numbers per Fishing Family are in parenthesis)

YEAR	TOTAL CATCH		EQUIVALENT CATCH[1]		MEAN EQUIVALENT CATCH PER FAMILY[1]	
	King Salmon	Small Salmon[2]	King Salmon	Small Salmon[2]	King Salmon	Small Salmon[2]
1961	23,719	407,814	23,719	405,632	38	650
1962	19,910	358,441	13,010	329,144	23	583
1963	32,656	421,625	26,141	372,578	44	624
1964	22,817	485,630	19,480	460,712	32	765
1965	19,723	458,379	16,950	436,306	31	806
1966	14,017	214,236	11,507	204,913	23	415
1967	19,661	288,595	16,306	256,926	35	545

YEAR	FISHING FAMILIES SURVEYED 1/	PEOPLE IN FISHING FAMILIES 1/	SNOW MACHINES 1/	SLED DOGS 1/	GEAR OPERATED 1/	
					GILL NETS	FISHWHEELS
1961	624	3,626(5.8)		4,806(7.7)	577	169
1962	564	3,279(5.8)		3,848(6.8)	613	138
1963	597	3,460(6.9)		4,155(7.0)	716	156
1964	602	3,524(6.0)		4,003(6.6)	840	155
1965	541	3,453(7.3)		3,974(7.3)	647	127
1966	494	3,144(6.4)		3,112(6.3)	578	116
1967	471	2,756(5.9)	192(.4)	2,752(5.8)	530	87

1/ Data from villages surveyed each year since 1961: mouth to Fort Yukon and Tanana River
2/ Mostly chum salmon, some pinks and cohos

TABLE 9

COMPARATIVE KING SALMON ESCAPEMENT DATA FOR 1960-1967, YUKON RIVER DRAINAGE 1/

	1960	1961	1962	1963	1964	1965	1966	1967
East Fork, Andreafsky River	1,020	1,003	675*	-	867	-	361	-
West Fork, Andreafsky River	1,220	-	762*	-	705	355*	303	276*
Totals, Andreafsky River	2,240	-	1,437*	-	1,572	-	664	-
Anvik River	1,950	1,226	-	-	-	650*	638	336*
Salcha River	1,660	2,878	937	-	450	408	800	-
Whitehorse Dam Bypass Actual Count 2/	660	1,068	1,500	484	587	903	563	533

1/ With exception of Whitehorse Dam Count, escapement data are from aerial surveys; a (*) indicates poor survey conditions.

2/ 1,054 counted in 1959, 1959-67 data from Canadian Department of Fisheries, Whitehorse

TABLE 10

COMPARATIVE NORTON SOUND DISTRICT COMMERCIAL
SALMON CATCHES AND FISHING EFFORT, 1961-1967

Year	Number of Licensed Fishing Vessels	KINGS	COHOS	PINKS	CHUMS	Total Salmon Catch
1961	62	5,300	13,807	34,237	48,332	101,676
1962	143	7,286	9,156	33,187	182,784	232,413
1963	144	6,613	16,765	55,895	154,789	234,062
1964	133	2,018	98 1/	13,567	148,862	164,545
1965	78	1,449	2,030	220 1/	36,795	40,494
1966	117	1,553	5,755	12,778	80,245	100,331
1967	79	1,804	2,376	28,851	41,496	74,527

1/ Represents incidental catch

Table 11

NORTON SOUND DISTRICT AERIAL SURVEY COUNTS
OF PINK AND CHUM SALMON, 1962-1967

Streams	1962 Chums	1962 Pinks	1962 Total	1963 Chums	1963 Pinks	1963 Total	1964 Chum	1964 Pinks	1964 Total
Unalakleet R.	-	-	47,043	-	-	19,305	-	-	28,214
North R.	-	-	16,088	-	-	73,274	-	-	5,981
Old Woman Fork	-	-	6,675						
North Fork	-	-	720						
Egavik R.	-	-	16,885	-	-	3,905			
Shaktoolik R.	-	-	36,417	-	-	28,987	-	-	16,327
Inglutalik R.	-	-	6,870	-	-	409			
Ungalik R.	-	-	2,597	-	-	76,220			
Tubutulik R.	-	-	16,691	16,068	4,355	20,423	15,469	10,043	28,932
Kwiniuk R.	-	-	23,251	11,340	3,779	15,119	14,533	-	14,533
Fish R.	-	-	28,918	8,210	23,737	31,947	18,670	10,935	44,155
Niukluk R.	-	-	27,879	13,687	4,103	17,790	8,395	10,495	18,890
Boston R.				1,669	0	1,669	3,315	0	3,315
Paragon R.				117	0	117			
Etchepuk R.				1,072	0	1,072			
Kachavik R.				16,000	16,000	32,000	5,284	3,675	8,959
Bonanza R.				111	12,085	12,196			
Eldorado R.				400	2,000	2,400			
Flambeau R.				400	80	480			
Rome R.				126	3,719	3,845	-	-	480
Sinuk R.				3,422	13,685	17,111			
Solomon R.				75	3,385	3,460			
Snake R.									
TOTALS	-	-	223,165	72,697	86,928	361,729	65,666	35,148	169,789

(Table Continued)

Table 11(Continued)

Streams	1965 Chums	1965 Pinks	1965 Total	1966 Chums	1966 Pinks	1966 Total	1967 Chum	1967 Pinks	1967 Total
Unalakleet R.				2,600	2,600	5,200			
North R.				5,810	10,790	16,600			
Old Woman Fork				1,637	14,733	16,370			
North Fork									
Egavik R.									
Shaktoolik R.				2,030	2,030	4,060			
Inglutalik R.									
Ungalik R.				-	-	2,025			
Tubutulik R.				4,363	26,000	30,363	16,856	5,619	22,475
Kwiniuk R.	32,565	7,980	48,752	-	-	24,597	23,904	3,150	27,054
Fish R.				16,296	4,489	20,785	9,527	4,083	13,610
Niukluk R.				21,300	8,600	34,600	13,355	7,191	20,546
Boston R.				761	0	761			
Paragon R.				315	0	315			
Eschepuk R.									
Kachavik R.				825	1,788	2,643			1,780
Bonanza R.									
Eldorado R.									
Flambeau R.									
Nome R.	294	-	294						
Sinuk R.	-	-	2,677			1,168			
Solomon R.									
Snake R.				-	2,500	2,500			
TOTALS	32,859	7,980	51,723	55,937	73,530	161,957	63,642	20,043	85,465

TABLE 12

COMPARATIVE NORTON SOUND DISTRICT SUBSISTENCE SALMON CATCHES, 1963 - 1967

YEAR	NUMBER OF FISHERMEN SURVEYED	KING 1/	COHO	PINK	CHUM	TOTAL (Catch Per Fisherman)
1963	44	5	439	26,607	[illegible]	38,857(883)
1964	44	565	2,567	9,225	12,[illegible]	24,848(565)
1965	71	574	4,812	19,131	30,[illegible]	[illegible](778)
1966	67	269	2,210	24,335	21,[illegible]	38,[illegible](577)
1967	119	817	1,222	17,516	26,[illegible]	46,[illegible]

1/ No catch data available from villages of Shaktoolik and Unal[illegible] where most kings taken

Table 13

PORT CLARENCE DISTRICT AERIAL

SURVEY COUNTS, 1963-1967

Streams	1963		1964		1965		1966		1967	
	Reds	Chum-Pink	Reds	Chum-Pink	Reds	Chum-Pink	Reds	Chum-Pink	Reds	Chum-Pink
Agiapuk River		825						4,890		
Kuzitrin River		22,000						2,773		
Pilgrim River		8,641		1,390		320		3,287		765
Salmon Lake	866		76		250		1,120		129	
Grand Central River	620		590		160		370		280	
Noxapaga River		62								
Bluestone River								283		
TOTALS	1,486	31,528	666	1,390	410	320	1,490	11,233	409	765

TABLE 14

COMPARATIVE PORT CLARENCE DISTRICT SUBSISTENCE SALMON CATCHES
1963 - 1967

YEAR	NUMBER OF FISHERMEN SURVEYED	KING	RED	COHO	PINK	CHUM	TOTAL (CATCH PER FISHERMEN)
1963	19	9	4,866	25	1,061	1,279	7,240 (381)
1964	22		1,475	227	371	1,049	3,122 (142)
1965	29	36	1,804	639	1,854	1,602	5,935 (205)
1966	26	10	1,000	896	859	2,875	5,640 (217)
1967	19	12	2,068	228	767	1,073	4,152 (219)